

We claim:

- 5 1. A random copolymer of propylene with other 1-alkenes having up to 10 carbon atoms,
 whose content of comonomers is in the range from 0.7 to 1.4%
 by weight if the only comonomer present in the propylene
 10 copolymers is ethylene, or
 whose content of comonomers is in the range from 0.7 to 3.0%
 by weight if at least one C₄-C₁₀-1-alkene is present as
 comonomer, and
 15 whose cold-xylene-soluble fraction is from 1.0 to 2.5% by
 weight if ethylene is present as a comonomer in the propylene
 copolymers, or
 20 whose cold-xylene-soluble fraction is from 0.75 to 2.0% by
 weight if the only comonomers present are C₄-C₁₀-1-alkenes.
2. A random propylene copolymer as claimed in claim 1 which
 25 comprises exclusively ethylene as comonomer.
3. A random propylene copolymer as claimed in claim 1, which
 comprises 1-butene as comonomer.
- 30 4. A random propylene copolymer as claimed in claim 1, whose Q₅
 value is greater than or equal to 200, where Q₅ is given by

$$35 \quad Q_5 = 1000 \times \frac{\mu(T_m)}{\mu(T_m - 5K)}$$

and

- 40 $\mu(T_m)$ is the elongational viscosity of the random propylene
 copolymer at the lowest temperature at which the copolymer is
 fully molten, and $\mu(T_m - 5K)$ is the elongational viscosity at a
 temperature which is lower by 5K, and the elongational
 viscosities are determined 2 seconds after stretching begins
 45 at a constant strain rate (Hencky strain rate) $\dot{\epsilon}$ of 0.2 s⁻¹.

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5. A random propylene copolymer as claimed in claim 1, whose PI (Processability Index) is greater than 18, where the PI is determined from the formula

$$PI = \ln(SH + 1) \cdot (\ln Q_3 + \ln Q_5),$$

Q_5 is given by

$$Q_5 = 1000 \times \frac{\mu(T_m)}{\mu(T_m - 5K)}$$

and Q_3 is given by

$$Q_3 = 1000 \times \frac{\mu(T_m)}{\mu(T_m - 3K)},$$

$\mu(T_m)$ is the elongational viscosity at the lowest temperature at which the copolymer is fully molten, $\mu(T_m - 5K)$ is the elongational viscosity at a temperature which is lower by 5K and $\mu(T_m - 3K)$ is the elongational viscosity at a temperature which is lower by 3K, and the elongational viscosities are determined 2 seconds after stretching begins at a constant strain rate (Hencky strain rate) $\dot{\epsilon}$ of 0.2 s^{-1} ,

and the factor SH (Strain Hardening) is the ratio of the maximum gradient of the curve of elongational viscosity plotted against time on a double logarithmic scale for temperatures less than $T_m - 5K$ to the gradient of the elongational viscosity curve 1 second after stretching begins at a constant Hencky strain rate $\dot{\epsilon}$ of 0.2 s^{-1} at a temperature of $T_m - 5K$.

6. A process for preparing random propylene copolymers as claimed in claim 1, in which propylene is polymerized with other 1-alkenes having up to 10 carbon atoms from the gas phase at from 50 to 100°C and at a pressure of 15 to 40 bar in the presence of a Ziegler-Natta catalyst system comprising

a) a titanium-containing solid component comprising at least one halogen-containing magnesium compound and an electron donor,

5 b) an aluminum compound and

c) at least one other electron-donor compound,

10 and the ratio of the partial pressures of propylene and of the comonomers is adjusted to from 400:1 to 15:1 and the molar ratio of the aluminum compound b) and the other electron-donor compound c) is adjusted to from 20:1 to 2:1.

15 7. A method of using the random propylene copolymers as claimed in claim 1 for producing films, fibers or moldings.

8. A film, a fiber or a molding comprising random propylene copolymers as claimed in claim 1.

20 9. A biaxially stretched film made from random propylene copolymers as claimed in claim 1 and having a stretching ratio of at least 4:1 in the longitudinal direction and of at least 5:1 in the transverse direction.

25 10. A process for producing biaxially stretched polypropylene copolymer films in which random propylene copolymers as claimed in claim 1 are melt-extruded through a die to give a film, the extruded film is cooled to from 100 to 20°C so that it solidifies, the solidified film is stretched in the longitudinal direction at from 80 to 150°C with a stretching ratio of at least 4:1 and in the transverse direction at from 120 to 170°C with a stretching ratio of at least 5:1.

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